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Europäisches
Patentamt

Zweigstelle
in Den Haag
Recherchen-
abteilung

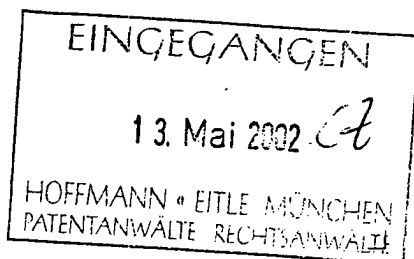
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Datum/Date

13.05.02 per

Zeichen/Ref./Réf.

84 975 a/scho

Anmeldung Nr./Application No./Demande n°/Patent Nr./Patent No./Brevet n°.

00126507.3

Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire

MITSUBISHI DENKI KABUSHIKI KAISHA

COMMUNICATION

The European Patent Office herewith transmits

- ☒ the European search report
- ☐ the declaration under Rule 45 EPC
- ☐ the partial European search report under Rule 45 EPC
- ☐ the supplementary European search report concerning the international application under Article 157(2) EPC relating to the above-mentioned European patent application. Copies of the documents cited in the search report are enclosed.

The following specifications given by the applicant have been approved by the Search Division :

- ☒ Abstract ☒ Title ☐ Figure
- ☐ The abstract was modified by the Search Division and the definitive text is attached to this communication.
- ☐ The following figure will be published with the abstract, since the Search Division considers that it better characterises the invention than the one indicated by the applicant.

Figure: 5, 40

- ☒ Additional copy(copies) of the documents cited in the European search report.

01

REFUND OF THE SEARCH FEE

If applicable under Article 10 Rules relating to fees, a separate communication from the Receiving Section on the refund of the search fee will be sent later.



EPO Form 1507 02.93



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	US 5 982 068 A (KUSASE SHIN ET AL) 9 November 1999 (1999-11-09) * column 4, line 10 - column 6, line 40; figures 1-19 *	1,3-8	H02K1/16
Y	US 4 102 040 A (RICH BERNARD J) 25 July 1978 (1978-07-25) * column 8, line 9 - column 10, line 43; figures 1-17 *	1,3,6-8	
Y	DE 17 63 506 A (LICENTIA GMBH) 11 November 1971 (1971-11-11) * page 3, line 19 - page 4, line 18; figures 1-3 *	4,5	
A	US 5 592 731 A (HUANG HAO ET AL) 14 January 1997 (1997-01-14) * column 5, line 47 - column 6, line 29; figures 1-11 *	1-3,6-9	
Y	EP 0 917 278 A (DENSO CORP) 19 May 1999 (1999-05-19) * column 4, line 57 - column 8, line 25; figures 1-5 *	1,3,6,8	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
Y	GB 2 108 772 A (WESTINGHOUSE ELECTRIC CORP) 18 May 1983 (1983-05-18) * page 3, left-hand column, line 20 - page 4, left-hand column, line 22; figures 1-5 *	1,3,6,8	H02K
Y,D	EP 0 881 752 A (DENSO CORP) 2 December 1998 (1998-12-02) * column 23, line 22 - column 33, line 9; figures 1-18 *	1,3-5	
-/--			
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 22 April 2002	Examiner Tangocci, A
<div>CATEGORY OF CITED DOCUMENTS</div> <div>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</div> <div>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</div>			

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EPO FORM 1503 03.82 (P04/C01)



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
✓Y	PATENT ABSTRACTS OF JAPAN vol. 007, no. 027 (E-156), 3 February 1983 (1983-02-03) & JP 57 183236 A (MITSUBISHI DENKI KK), 11 November 1982 (1982-11-11) * abstract *	1,3-5	
A	--- US 4 080 724 A (GILLETTE WILLARD D) 28 March 1978 (1978-03-28) * column 3, line 9 - line 68; figures 2-4 *	1-3,6-9	
✓A	--- EP 0 833 427 A (MATSUSHITA ELECTRIC IND CO LTD) 1 April 1998 (1998-04-01) * abstract; figures 1-4 *		
A	--- PATENT ABSTRACTS OF JAPAN vol. 010, no. 197 (E-418), 10 July 1986 (1986-07-10) & JP 61 042258 A (MATSUSHITA ELECTRIC IND CO LTD), 28 February 1986 (1986-02-28) * abstract *	9	
✓A	--- US 5 729 072 A (KIKUCHI SEIJI ET AL) 17 March 1998 (1998-03-17) * abstract; figures 1-5 *	1-9	
✓A	--- EP 0 248 946 A (SHICOH ENG CO LTD) 16 December 1987 (1987-12-16) * column 8, line 29 - line 53; figures 4-6 *	4-9	
✓A	--- US 3 056 896 A (HEINZ HEILMANN ET AL) 2 October 1962 (1962-10-02) * figures 1,2 *	4-9	
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 22 April 2002	Examiner Tangocci, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P04C01)



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 4 012 653 A (SHIGETA MASAYUKI ET AL) 15 March 1977 (1977-03-15) * figures 2-6 * -----	4-9	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 22 April 2002	Examiner Tangocci, A
<div>CATEGORY OF CITED DOCUMENTS</div> <div>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</div> <div>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</div>			

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EPO FORM 1503 03.82 (P04C01)



CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-3, and 6-9 when appended to any one of 1-3

Axially extending abutting portion of stator core of alternator, such that said core becomes an annular shape by joining its ends at said abutting portion.

2. Claims: 4, 5 and 6-9 when appropriately appended to 4-8

Outer circumferential portion of stator core of alternator, fitted over the outer circumference of the core, to improve the magnetic performance and the roundness of the core.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 12 6507

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-04-2002

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 12 6507

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22-04-2002

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0881752	A		US	6137201 A	24-10-2000
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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82



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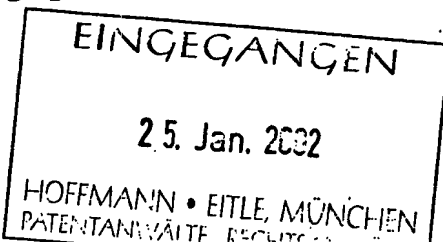
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Division de la
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Ruan

Datum/Date
24.01.02

Zeichen/Ref./Réf. 84 975 a/scho	Anmeldung Nr./Application No./Demande n°./Patent Nr./Patent No./Brevet n° 00126507.3-2207/
Anmelder/Applicant/Demandeur//Patentinhaber/Proprietor/Titulaire MITSUBISHI DENKI KABUSHIKI KAISHA	

021

COMMUNICATION

The European Patent Office herewith transmits the partial European search report under Rule 46(1) EPC relating to the above-mentioned European patent application.

Copies of the documents cited in the search report are enclosed.

The applicant's attention is drawn to the following:

The search Division informs the applicant that if the European search report is also to cover inventions other than the invention first mentioned in the claims, a further search fee must be paid for each of these inventions, within ONE MONTH after notification of this communication.

If the application has been filed up to 30 June 1999, the search fee in force before 01 July 1999 (EUR 869,-) or the equivalent applicable on the date of payment is payable.

This applies also to the search fees requested under Rule 46(1) EPC.

See also OJ EPO 06/1999, 405.

- ☐ The abstract was modified by the Search Division and the definitive text is attached to the present communication.
- ☒ Additional set(s) of copies of the documents cited in the European search report is (are) enclosed as well. 01



Note to users of the automatic debiting procedure:

Unless the EPO receives prior instructions to the contrary, the search fee(s) will be debited on the last day of the period for payment. For further details see the Arrangements for the automatic debiting procedure, Supplement to OJ EPO 02/1999.

REGISTERED LETTER



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	US 5 982 068 A (KUSASE SHIN ET AL) 9 November 1999 (1999-11-09) * column 4, line 10 - column 6, line 40; figures 1-19 *	1,3,6-8	H02K1/16 H02K15/02
Y	US 4 102 040 A (RICH BERNARD J) 25 July 1978 (1978-07-25) * column 8, line 9 - column 10, line 43; figures 1-17 *	1,3,6-8	
A	US 5 592 731 A (HUANG HAO ET AL) 14 January 1997 (1997-01-14) * column 5, line 47 - column 6, line 29; figures 1-11 *	1-3,6-9	
Y	EP 0 917 278 A (DENSO CORP) 19 May 1999 (1999-05-19) * column 4, line 57 - column 8, line 25; figures 1-5 *	1,3,6,8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			H02K
LACK OF UNITY OF INVENTION			
The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:			
see sheet B			
The present partial European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims.			
Place of search MUNICH		Date of completion of the search 11 January 2002	Examiner Tangocci, A
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

1

EPO FORM 1503 03.82 (P04C27)



DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
Y	GB 2 108 772 A (WESTINGHOUSE ELECTRIC CORP) 18 May 1983 (1983-05-18) * page 3, left-hand column, line 20 - page 4, left-hand column, line 22; figures 1-5 *	1,3,6,8	
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A	--- EP 0 833 427 A (MATSUSHITA ELECTRIC IND CO LTD) 1 April 1998 (1998-04-01) * abstract; figures 1-4 *	2	
A	--- PATENT ABSTRACTS OF JAPAN vol. 010, no. 197 (E-418), 10 July 1986 (1986-07-10) & JP 61 042258 A (MATSUSHITA ELECTRIC IND CO LTD), 28 February 1986 (1986-02-28) * abstract *	9	TECHNICAL FIELDS SEARCHED (Int.Cl.7)



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-3, and 6-9 when appended to any one of 1-3

Axially extending abutting portion of stator core of alternator, such that said core becomes an annular shape by joining its ends at said abutting portion.

2. Claims: 4, 5 and 6-9 when appropriately appended to 4-8

Outer circumferential portion of stator core of alternator, fitted over the outer circumference of the core, to improve the magnetic performance and the roundness of the core.

Said two groups of claims describe independent inventive concepts, linked only by the fact that they are both used in an alternator of a known type.

The link between the inventions required by Article 82 must be a technical relationship which finds expression in the claims in terms of the same or corresponding special technical features (features that define a contribution that the claimed invention considered as a whole makes over the prior art). Guidelines for Examination, C III 7.2 and Rule 30(1).

The application has been divided into the above (groups of) inventions which individually are considered to meet the requirement of unity. If additional fees are paid for (one or more of) the, as yet, unsearched invention(s), the subsequent search(es) might reveal prior art which leads to a finding of lack of unity a posteriori within (one or more of) the, as yet, unsearched invention(s). Should this be the case, as a rule, no further invitation to pay additional fees will be issued. Only the first identified invention in each group of inventions, for which additional search fees have been paid in due time and which subsequently is considered to lack unity, will be searched.

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 00 12 6507

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11-01-2002

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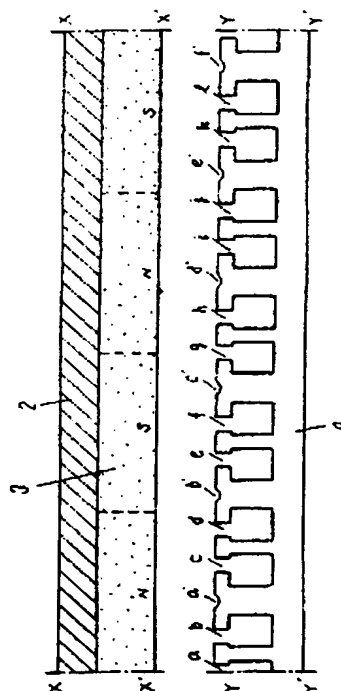
APPLICATION DATE : 01-08-84
APPLICATION NUMBER : 59161865

APPLICANT : MATSUSHITA ELECTRIC IND CO LTD;

INVENTOR : GOTO MAKOTO;

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TITLE : MOTOR



ABSTRACT : PURPOSE: To reduce a cogging torque by specifying the disposition of a groove for windings more than the number of poles of a field.

CONSTITUTION: A magnet 3 mounted on a rotor 2 has field poles of P poles (P is 4 or more integer number), and an armature core 4 has teeth formed between grooves (a)-(l) for T pieces (T is number of magnification of 3 of P or larger integer number) of windings wound with windings of 3 phases. The core 4 has L pieces (L is integer number) of long teeth at the effective pitch larger than $D = 360^\circ/T$, and M pieces (M is integer number) of short teeth at the effective pitch smaller than D, and the numbers of the long and short teeth are set to $L \geq 3$, $M \geq 3$. The ratio of the effective pitch of the short teeth to that of the long teeth is set to $R:R+1$ (R is integer number), and auxiliary grooves (a')-(f') are formed at the long teeth. The entire grooves of the core 4 made of the grooves (a)-(l) and the auxiliary grooves (a')-(f') are disposed at an interval of 1 divided by R of the effective pitch of the short teeth.

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